Problem 32

NO, this is because that decreasing link cost won't cause a loop (caused by the next-hop relation of between two nodes of that link). Connecting two nodes with a link is equivalent to decreasing the link weight from infinite to the finite weight.

Problem 35

Since full AS path information is available from an AS to a destination in BGP, loop detection is simple – if a BGP peer receives a route that contains its own AS number in the AS path, then using that route would result in a loop.

Problem 37

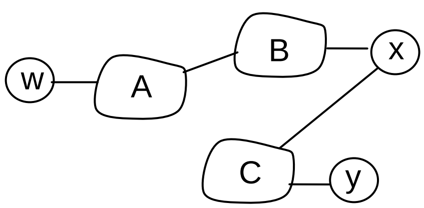
a) eBGP

b) iBGP

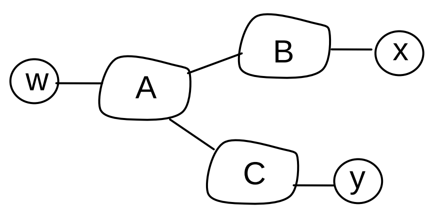
c) eBGP

d) iBGP

Problem 40



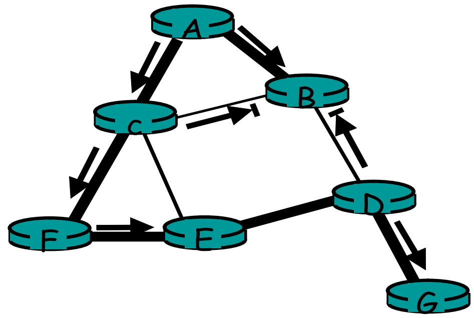
X's view of the topology



W's view of the topology

In the above solution, X does not know about the AC link since X does not receive an advertised route to w or to y that contain the AC link (i.e., X receives no advertisement containing both AS A and AS C on the path to a destination.

Problem 46



The thicker shaded lines represent
The shortest path tree from A to all
destination. Other solutions are
possible, but in these solutions, B
can not route to either C or D from A.

Problem 7 (chapter 5)

a) Without loss of generality, suppose ith bit is flipped, where 0<= i <= d+r-1 and assume that the least significant bit is 0th bit.
A single bit error means that the received data is K=D*2r XOR R + 2i. It is clear that if we divide K by G, then the reminder is not zero. In general, if G contains at least two 1's, then a single bit error can always be detected.

The key insight here is that G can be divided by 11 (binary number), but any number of odd-number of 1's cannot be divided by 11. Thus, a sequence (not necessarily contiguous) of odd-number bit errors cannot be divided by 11, thus it cannot be divided by G.